AMENDMENTS

In the Claims:

Cancel claims 1-26.

The following claims are new:

27. (New) A method of decoding an array composition comprising:

a) providing an array comprising:

i) a substrate with a surface comprising discrete sites; and

ii) a population of microspheres comprising at least first and second subpopulations, wherein each subpopulation comprises a distinct capture probe, randomly distributed on said sites;

b) providing a population of decoding probes wherein each of said decoding probes is complementary to one of said capture probes;

c) dividing said population into a plurality of first sets wherein each of said first sets is labeled with a different label;

d) obtaining a first image by:

i) hybridizing said first sets to said capture probes; and

ii) detecting the signal at each location in the array;

e) dividing said population into a plurality of second sets, wherein said first and second sets are different, and each of said second sets is labeled with a different label;

f) obtaining a second image by:

i) hybridizing said second sets to said capture probes; and

ii) detecting the signal at each location in the array; and

g) analyzing said first image and said second image to decode said array.

28. (New) The method according to claim 27, further comprising:

g) optionally repeating steps e), f) and g) to decode said array.

29. (New) The method according to claim 27 or 28, wherein said microspheres comprise bioactive agent.

30. (New) The method according to claim 29, wherein at least one of said bioactive agents is a nucleic acid.

31. (New) The method according to claim 29, wherein at least one of said bioactive agents is a protein.

32. (New) A method of decoding an array comprising:

a) contacting an array comprising a population of microspheres comprising a plurality of subpopulations, wherein each subpopulation comprises a distinct bioactive agent, with a first plurality of labeled decoding binding ligands,

b) obtaining a first image of the location of each of said first population of labeled decoding binding ligands;

c) removing said first population of labeled decoding binding ligands;

d) contacting said array with a second plurality of labeled decoding binding ligands;

e) obtaining a second image of the location of each of said second population of labeled decoding binding ligands;

f) analyzing said first and second image to decode said array.

33. (New) The method according to claim 32, whereby the number of labels in said first or second plurality of labeled decoding binding ligands is less than the number of subpopulations of microspheres.

34. (New) The method according to claim 32, whereby said first and second plurality of labeled decoding binding ligands comprise the same population of decoding binding ligands, but are labeled differently.